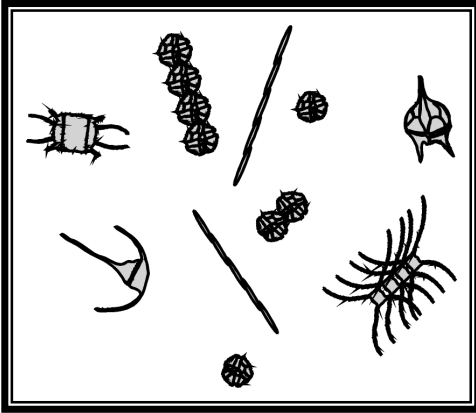


# BIOTOXIN MONTHLY REPORT

## June 1999



### PHYTOPLANKTON MONITORING:

#### *Pseudo-nitzschia* Bloom

#### Continues in Southern California

The enclosed report (No. 99-16) shows the distribution of toxigenic phytoplankton during June. The resurgence of *Pseudo-nitzschia* that began along the Southern California coast at the end of May continued through most of June. Our volunteer observers along the coast of San Diego and Orange counties reported that this diatom was the predominant species during this time. The highest cell densities appeared to occur in northern San Diego County (Baticuitos Lagoon, Agua Hedionda Lagoon, Oceanside), southern Orange County (San Clemente), offshore of the Palos Verdes peninsula in Los Angeles County, and in Santa Barbara County (Goleta).

The observations of program volunteers indicated that, in general, diatoms species were most abundant during the first two weeks of June. While *Pseudo-nitzschia* remained abundant at many sites through the third week of June, there was an

increase in the number of dinoflagellate species during this period. By the last week of June several dinoflagellate species, including *Ceratium* spp., *Gonyaulax* *poledra*, and *Prorocentrum* *micans*, were predominant along the southern California coast. *Alexandrium* was only observed at one site in Santa Barbara, however

### SHELLFISH MONITORING: Domoic Acid Absent

Because *Pseudo-nitzschia* once again increased in numbers, we continued to look for domoic acid in shellfish samples collected from selected areas. The state's Food and Drug Laboratory reported that there was no detectable toxin present in any of the samples collected in June, indicating that the species of *Pseudo-nitzschia* that was abundant was not a toxin-producer. It is also possible that cell densities were not great enough to produce detectable

levels of the toxin in the mussel tissue.

For the third month in a row PSP toxicity was absent at all sampling locations. This pattern is consistent with the observations that diatoms were the most common group of phytoplankton for most of June. The increase in dinoflagellate species towards the end of June is an indication that oceanic conditions are changing in favor of this group, which includes the PSP toxin-producer *Alexandrium* *catenella*. If this pattern persists there will be a greater probability of detecting PSP toxicity in the coming weeks.

### Quarantines

The annual quarantine on sport-harvested mussels occurs each year from May 1 through midnight on October 31. This quarantine applies only to sport-harvested mussels along the entire California coastline, including all bays and estuaries.

Consumers of Washington clams, also known as butter clams, are cautioned to eat only the white meat. This particular species is known to concentrate and retain the PSP toxins for a long period of time. By discarding the dark part of the siphon and the viscera the consumer can reduce the risk of ingesting these toxins. Persons taking any clams or scallops are advised to remove and discard the dark parts (i.e., the digestive organs or viscera), which are more likely to contain toxins than the

### How to Contact Us:

*The Biotoxin Monthly Report is prepared and distributed by the California Department of Health Services' Marine Biotoxin Monitoring and Control Program.*

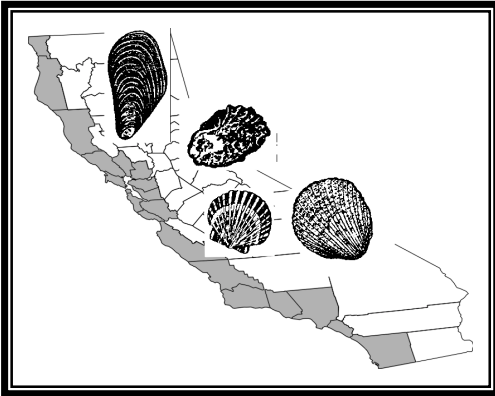
*For information on our program please call (510) 540-3423, fax us at (510) 540-2716, or send me an email at [glangloi@ix.netcom.com](mailto:glangloi@ix.netcom.com).*

*Call our toll-free number for recorded information on shellfish quarantines related to marine biotoxins: (800) 553-4133.*

(Continued on page 2)

white tissue.

We also advise that persons engaged in the sport-harvesting of any bivalve shellfish should contact our "Shellfish Information Line" at 1-800-553-4133 for a current update on marine biotoxin activity.



## History of the Marine Biotoxin Monitoring Program

Humans have been eating shellfish for thousands of years. However, ever since we recognized that shellfish are edible, we've also recognized their potential for harm. Although early shellfish harvesters would not have known the meaning of "filter feeder," they certainly would have observed that at certain times of the year, and in response to certain events, otherwise safe shellfish become poisonous.

Along the California coast, Pomo Indians forbade shellfish harvesting for two days after observing bioluminescence in the waters. The Pomo had essentially established the link between PSP toxicity in shellfish and, by way of the onset of luminescence, the occurrence of dinoflagellates. When dinoflagellates are abundant there is a greater chance that *Alexandrium*, as well as its toxins, would also present.

The first well-documented case of PSP poisoning among European settlers in North America occurred in 1873, when members of Captain George Vancouver's crew became ill after eating mussels harvested in British Columbia. The first recorded PSP outbreak in California occurred in 1903. Twelve people who ate mussels harvested from Timber Cove, Sonoma County became ill, and five died.

However, it was not until 1927 that California health officials recognized the serious potential of PSP. In this year, a major outbreak extending from Sonoma to Monterey affected 102 people and resulted in 6 deaths. Reports from doctors and physicians "brought out the fact that mussel poisoning along the coast of California is a rather common phenomenon. Besides those previously recorded, numerous single and group intoxications (extending up to 50 years earlier) are recalled by the inhabitants." (Sommer and Meyer, 1937). In response to the 1927 epidemic, it became mandatory to report PSP cases in California. At the same time, the California PSP Prevention Program was established as part of the California Department of Health Services (DHS). It was the first such program in the United States.

DHS began by issuing annual warnings about eating shellfish harvested during summer months. As documentation of PSP cases increased, the warnings became geographically and temporally specific quarantines. By 1942, sport mussel harvesting along the entire California coast was prohibited from May 1 to October 31. Mussels and other bivalves grown and harvested by licensed commercial operators are subject to a separate

testing system. The sport-harvest quarantine, still in effect today, is restricted to mussels because they tend to live along the open coast where they are quickly exposed to oceanic blooms of *Alexandrium catenella*. Mussels also tend to acquire and concentrate the toxin more rapidly than other species of shellfish, and have been responsible for 83% of all PSP cases in California, and 78% of all deaths.

Information obtained from sampling mussel PSP toxin levels is used to supplement and modify the quarantine, including extending the time period or the kinds of molluscs covered.

In the time period from 1900-1989, California experienced 539 illnesses due to PSP, and 39 deaths. Were it not for the fact that California was also the first state to implement and Marine Biotoxin Monitoring Program, these numbers would undoubtedly be much higher. With a vigilant monitoring program and public education, the incidence of PSP has dropped dramatically, and California no longer has the highest incidence of reported PSP cases in North America. To maintain public safety, adherence to commercial shellfish harvesting regulations and the quarantine on sport-harvested mussels is extremely important.

Chris Terry

- Price, D.W.; K.W.Kizer; and K.H.Hansgen. 1991. California's Paralytic Shellfish Poisoning Prevention Program, 1927 - 89, Journal of Shellfish Research, 10(1): 119-145.

- Sommer, H.; and Meyer, K.F. 1937. Paralytic shellfish poisoning, Archives of Pathology, 24:560-598.

**Table 1.** California Marine Biotoxin Monitoring and Control Program participants submitting shellfish samples during June 1999.

COUNTY	AGENCY	SAMPLES
<b>Del Norte</b>	Del Norte County Health Department	2
<b>Humboldt</b>	Coast Seafood Company	4
<b>Mendocino</b>	CDHS Volunteer	2
<b>Sonoma</b>	Environmental Management Branch	1
<b>Marin</b>	Bay Bottom Beds, Inc.	3
	Cove Mussel Company	4
	California State University Monterey Bay	4
	CDHS Environmental Management Branch	4
	Hog Island Oyster Company	3
	Johnson Oyster Company	20
<b>San Francisco</b>	San Francisco County Health Department	2
<b>San Mateo</b>	San Mateo County Environmental Health Department	2
	California State University Monterey Bay	3
<b>Santa Cruz</b>	Santa Cruz County Environmental Health Department	2
<b>Monterey</b>	California State University Monterey Bay	7
	Monterey County Environmental Health Department	1
<b>San Luis Obispo</b>	Williams Shellfish Company	5
	San Luis Obispo County Environmental Health Department	2
<b>Santa Barbara</b>	U.C. Santa Barbara Marine Science Institute	5
	Vandenberg Air Force Base, Environmental Health Services	1
<b>Ventura</b>	Ventura County Environmental Health Department	1
<b>Los Angeles</b>	Los Angeles County Health Department	3
<b>Orange</b>	Orange County Health Care Agency	1
	Ecomar, Inc.	2
<b>San Diego</b>	CDHS Volunteer	1
	Carlsbad Aquafarms, Inc.	4

**Table 2.** Agencies and organizations participating in marine phytoplankton sample collection in California during June 1999.

COUNTY	AGENCY	SAMPLES
<b>Del Norte</b>	Crescent Coastal Research	1
<b>Humboldt</b>	Coast Seafood Company	5
	Humboldt State University Marine Lab	2
<b>Mendocino</b>	California Department of Parks and Recreation	1
	CDHS Volunteer (John Richardson)	4
<b>Sonoma</b>	None Submitted	
<b>Marin</b>	CDHS Volunteer (Brent Anderson)	4
	CDHS Environmental Management Branch	7
	Johnson Oyster Company	20
<b>Alameda</b>	None Submitted	
<b>San Francisco</b>	CDHS Volunteer (Eugenia McNaughton)	2
<b>San Mateo</b>	None Submitted	
<b>Santa Cruz</b>	O'Neill Yacht Charters	1
	Santa Cruz County Environmental Health Department	2
	California Department of Parks and Recreation	1
<b>Monterey</b>	U.C. Reserve System	1
<b>San Luis Obispo</b>	Morro Bay 4-H	1
	Tenara Environmental	1
	CDHS Environmental Management Branch	1
<b>Santa Barbara</b>	California Department of Parks and Recreation	3
	Vandenberg Air Force Base, Environmental Health Services	1
	U.C. Santa Barbara Marine Sciences	3
	CDHS Volunteer (Jeff Kermode)	1
<b>Ventura</b>	California Department of Parks and Recreation	2
<b>Los Angeles</b>	Southern California Marine Institute, Fish Harbor Lab	3
	Los Angeles County Sanitation District	1
	Los Angeles County Health Department	1
<b>Orange</b>	Orange County Marine Institute	2
	Orange County Sanitation District	4
	CDHS Volunteer (Jeff Kermode)	1
	Ecomar, Inc.	1
<b>San Diego</b>	CDHS Volunteers (Paul Sims, Randy and Bill Dick, Kai Schumann, Jeff Kermode, Vicki Ganguli, and Rachel Woodfield)	12
	San Diego County Environmental Health	8

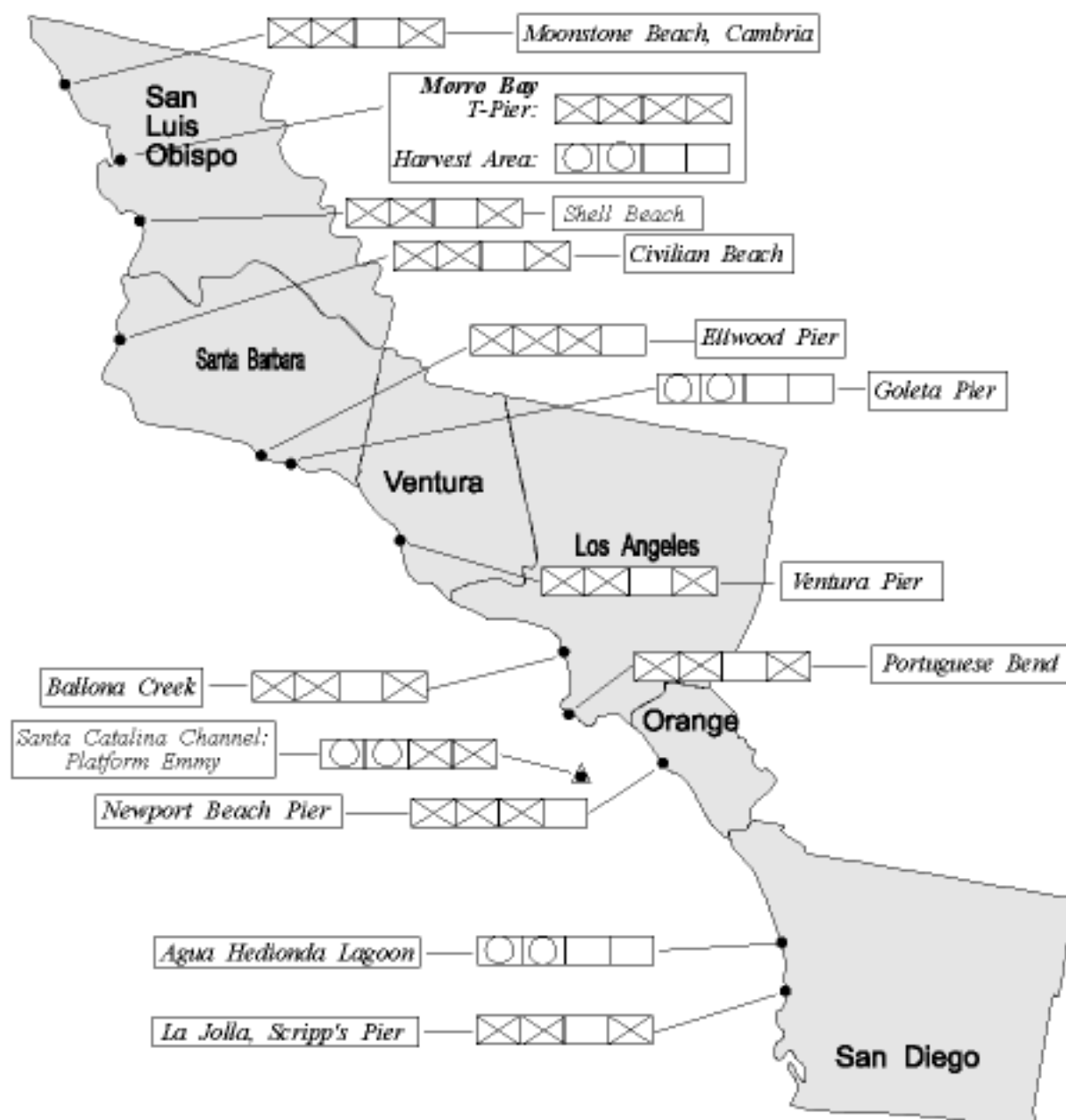
# SHELLFISH BIOTOXIN MONTHLY REPORT

June 1999

Technical Report No. 99-15

## Distribution of Shellfish Biotoxins

### Southern California



#### KEY FOR SHELLFISH BIOTOXIN DATA

Week: 1 2 3 4

PSP Range: (ug/100 g)  
no sample not detected < 80<sup>1</sup> ≥ 80

DA Range: (ppm)  
no sample not detected < 20<sup>2</sup> ≥ 20

<sup>1</sup>PSP Alert Level <sup>2</sup>DA Alert Level  
● = Single Site ● = Multiple Sites ▲ = Offshore Site

Source: DHS Marine Biotoxin Monitoring and Control Program, June 1999.

## INTRODUCTION:

Please note the following conventions: (i) All data are for mussel samples, unless otherwise noted; (ii) All samples are analyzed for PSP toxins; domoic acid (DA) analyses are performed as needed (i.e., on the basis of detected blooms of the diatoms that produce DA). Please refer to the figure key for an explanation of the symbols used for the time of month of sample collection and the toxicity range.

### Southern California Summary:

**Paralytic Shellfish Poisoning (PSP):** PSP toxicity was not detected at any sampling stations during June.

### Domoic Acid (DA):

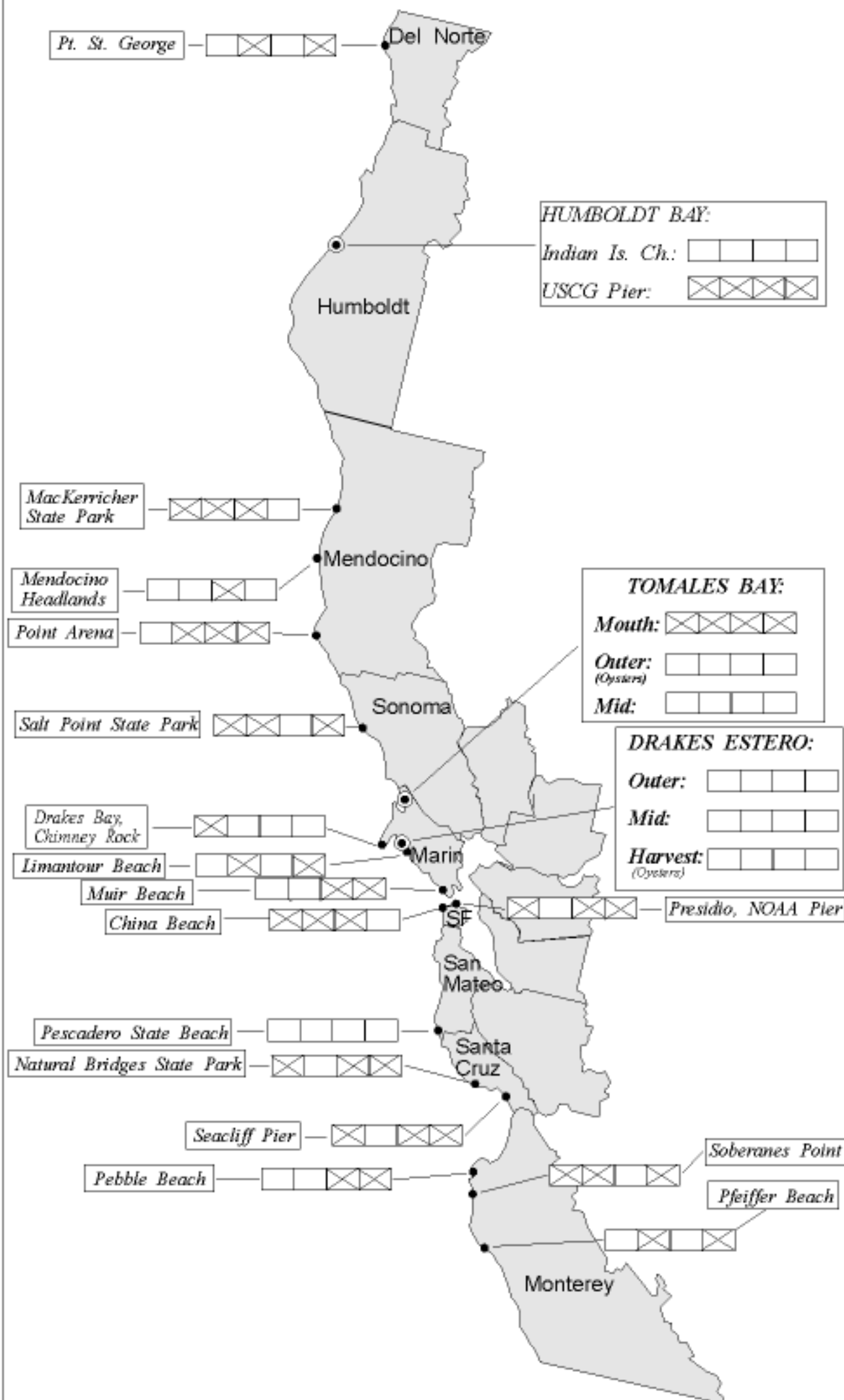
A continuing bloom of *Pseudo-nitzschia* at several southern California locations (see Technical Report No. 99-16) prompted the continued analysis of shellfish samples for DA during the first two weeks of June. The state's Food and Drug Laboratory reported that there was no detectable DA in any shellfish samples collected during this time.

*For Information on our Volunteer  
Field Sampling Program Please Call:*

**(510) 540-3423**

# Distribution of Shellfish Biotoxins

## Northern California



### Northern California Summary:

#### Paralytic Shellfish Poisoning (PSP):

PSP toxicity was not detected in any shellfish samples collected from Northern California counties during June.

*The Marine Biotoxin Monitoring and Control Program is a state-wide effort involving a consortium of volunteer participants. The shellfish sampling and analysis element of this program is intended to provide an early warning of shellfish toxicity by routinely assessing coastal resources for the presence of paralytic shellfish poisoning (PSP) toxins.*

*For More Information Please Call:  
(510) 540 - 3423*

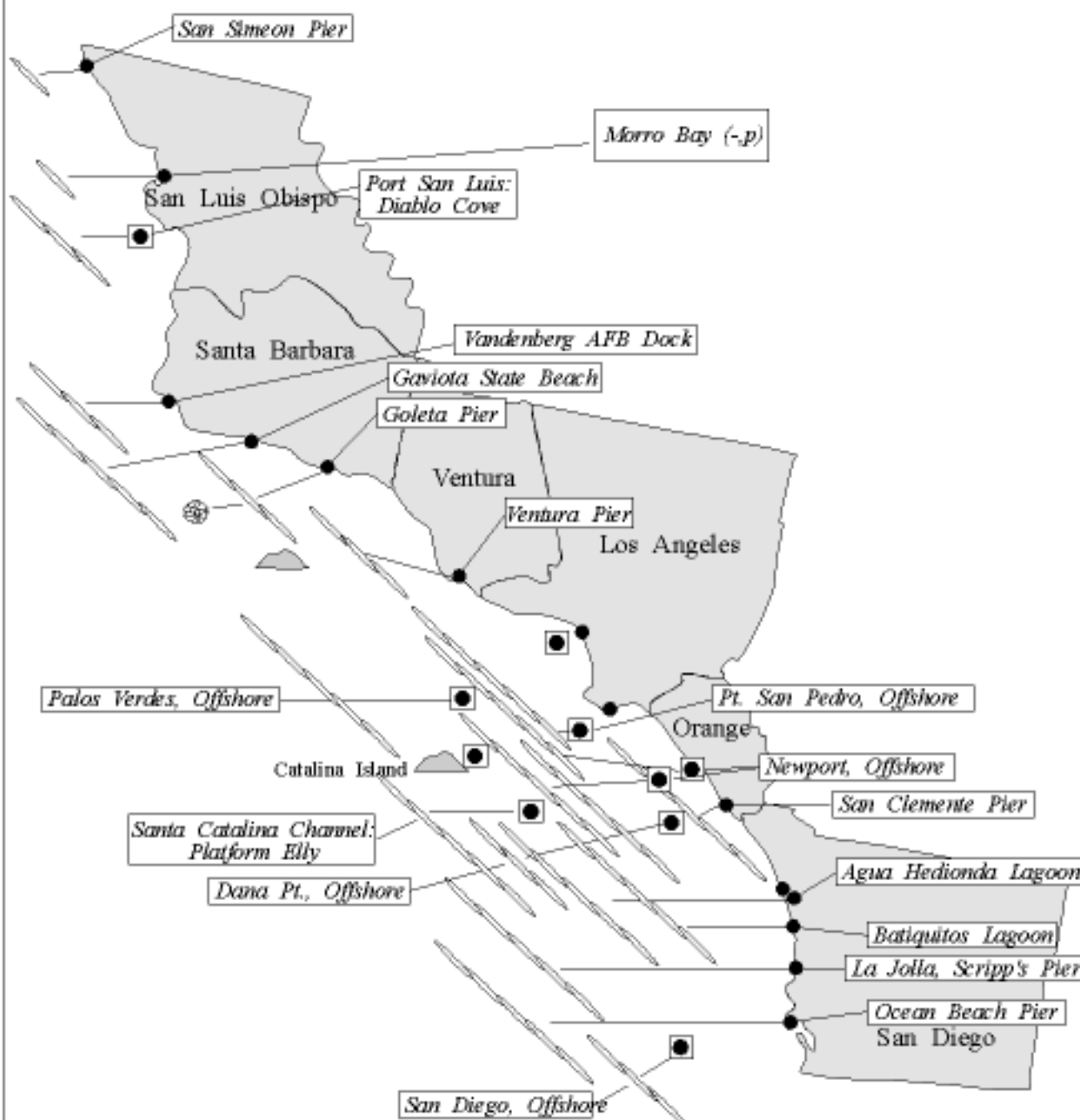
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(800) 553 - 4133*

# Phytoplankton Monthly Report

June 1999

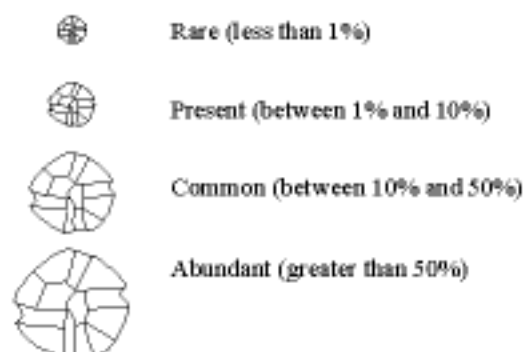
Technical Report No. 99-16

## Distribution of Toxin Producing Phytoplankton Southern California

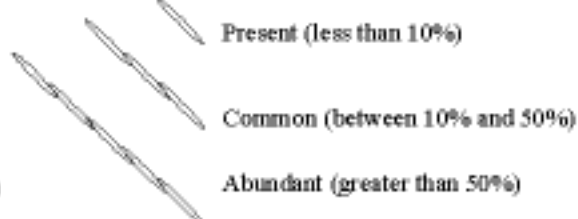


### Relative Abundance of Known Toxin Producers

#### Alexandrium Species



#### Pseudo-nitzschia Species



#### MONTHLY SAMPLING STATIONS:

- Single Sampling Station
- ⊙ Multiple Sampling Stations
- Offshore Sampling Station

For areas with multiple sampling stations, species abundance at each station is represented as follows:  
(a,p) = Abundance for Alexandrium and Pseudo-nitzschia.  
e.g., (c,p) = common, present; (a,-) = abundant, not observed

### Southern California Summary:

*Alexandrium catenella* (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). Low numbers of *Alexandrium* were observed in a sample collected from the Goleta Pier on June 30.

*Pseudo-nitzschia* species (includes all known potential domoic acid producing diatoms). The high relative abundances of *Pseudo-nitzschia* observed in May along the coast from San Diego through Santa Barbara counties continued throughout June in this region. The peak in relative abundance and density appeared to occur by the third week of the month for most areas. Lower relative abundances of this diatom were observed farther north along the coast of San Luis Obispo.

The state's Food and Drug Laboratory reported that domoic acid was not found in any of the mussel samples analyzed.

*The Phytoplankton Monitoring Program, managed by the California Department of Health Services, is a state-wide program designed to detect toxin producing species of phytoplankton in ocean water before they impact California's valuable shellfish resources or become a threat to consumer safety.*

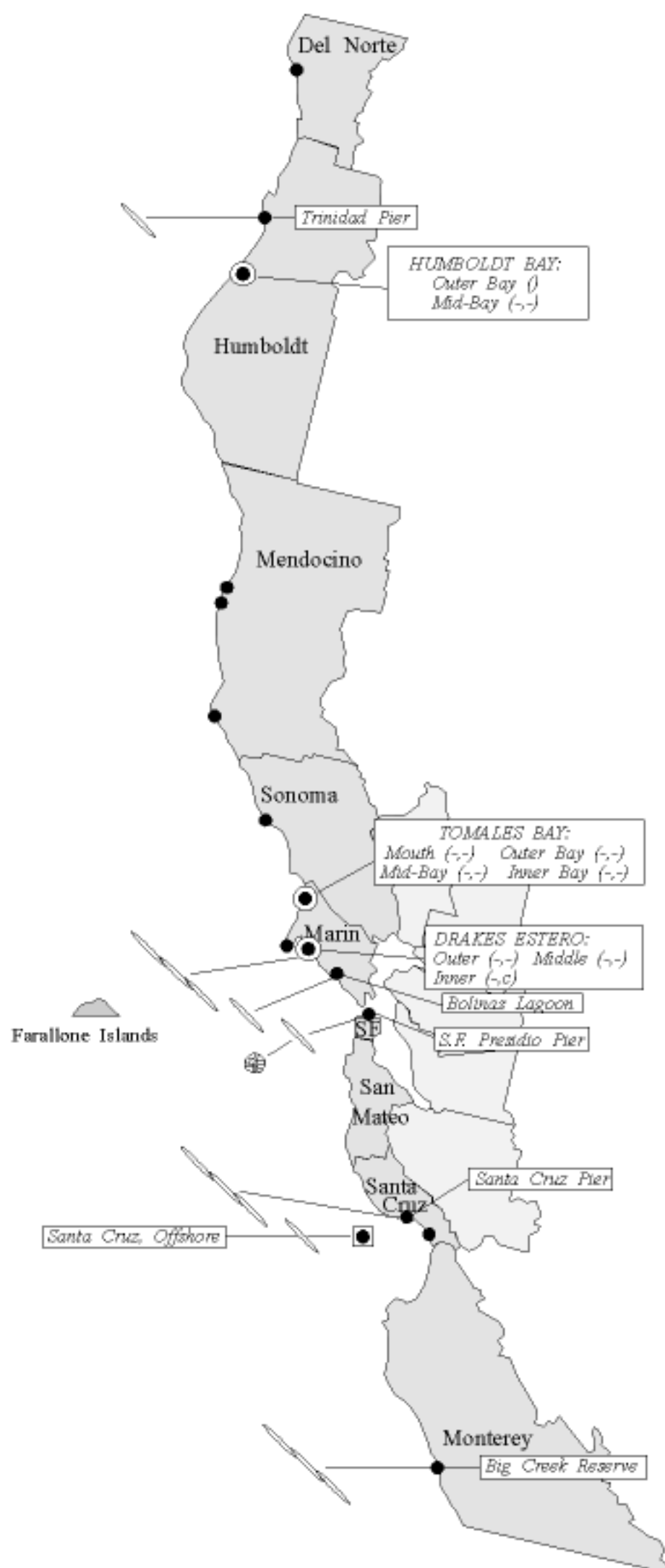
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June 1999

## Distribution of Toxin Producing Phytoplankton Northern California



### Northern California Summary:

*Alexandrium catenella* (Dinoflagellate that produces paralytic shellfish poisoning (PSP) toxins). *Alexandrium* was observed at only one Northern California site during June. A low number of cells were detected in a sample from the Presidio Pier, just inside the Golden Gate, on June 27.

*Pseudo-nitzschia* species (includes all known potential domoic acid producing diatoms). Low numbers of *Pseudo-nitzschia* were observed at several sites along the coast between Monterey and Marin counties in June. Low numbers of this diatom were detected as far north as Trinidad Pier in northern Humboldt County. The relative abundance and cell numbers of *Pseudo-nitzschia* were low for all of these observations.

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